

REMARKS

Claims 1 and 2 have been amended to incorporate therein the recitation of claim 6.

Claim 6 has been canceled. Entry of the amendments constituting the combination of existing claims is respectfully requested as placing the case in condition for allowance.

Review and reconsideration on the merits are requested.

Claims 1, 5-12, 18, 20 and 22 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,716,942 to Saito et al.

Claims 2, 3, 13-17, 19, 21 and 23 were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,716,945 to DeSimone et al.

The methods of amended claims 1 and 2 comprise polymerizing a radical polymerizable monomer in a manner of continuous polymerization in a defined reaction-field having a ratio $[\rho_m/\rho_0]$ of not lower than 1.1 carried out in a condition such that an amount of the fluoropolymer in a reaction vessel amounts to at least 8 g per liter of the capacity of the reaction vessel in a steady state. It is the combination of the above-noted characteristic features of the invention which patentably distinguishes over the cited prior art.

More particularly, the defined-reaction field having the specific ratio $[\rho_m/\rho_0]$ and continuous polymerization limited to the specifically claimed condition such that an amount of the fluoropolymer in the reaction vessel amounts to at least 8 g per liter of the capacity of the reaction vessel in a steady state, surprisingly exhibits the advantageous effects of high polymerization rate, excellent productivity, production of polymers having a high molecular weight, a unimodal molecular weight distribution and a ratio M_w/M_n within the claimed range of

higher than 1 but not higher than 3. These effects of the invention, which could not have been expected based on the disclosure of Saito et al., are described at page 13, line 31-page 14, line 6 and at page 17, lines 3-7 of the specification.

Although the reason is not apparent, polymerization preferentially proceeds within the forming fluoropolymer particles ("polymerization field (P)") (page 12, line 18-page 13, line 19). By increasing the amount of the fluoropolymer in the reaction vessel, it becomes possible to promote the reaction in the polymerization field (P). See page 17, lines 3-7 of the specification. Comparative Examples 1 and 2 exhibit a bimodal molecular weight distribution.

Applicants comment on specific differences between the claimed invention and the cited prior art as follows.

The limitation of "at least 8 g per liter" is the value calculated by converting the amount of the fluoropolymer discharged from the reaction vessel per residence time at the above-mentioned steady state to the amount per liter of the capacity of the reaction vessel (page 17, lines 17-21 of the specification). The batch-wise method of Saito et al. does not disclose this characteristic feature of the invention. For this reason alone, amended claim 1 and the claims depending therefrom define novel subject matter.

The molecular weight distribution of DeSimone et al. is bimodal.

With regard to ρ_m/ρ_0 , the Examiner states that the monomer densities of HFV and VdF are at least their critical density, and the calculation based on vacuum volume of the autoclave is questionable (page 6 of the Office Action).

Applicants respond as follows.

The monomer critical density ρ_0 means the monomer density at the supercriticality-expression temperature and supercriticality-expression pressure (page 14, lines 17-20 of the

specification). Since the temperature does not exceed T_C of HFP and the temperature does not exceed P_c of VdF in the Examples of Saito et al., Applicants respectfully disagree with the Examiner's position.

The monomer density to ρ_m is determined by dividing the mass of the radical polymerizable monomer introduced into the reactor by the volume of the reactor (page 14, lines 29-31 of the specification). The nitrogen gas present in the reaction field does not affect the monomer density. Thus, the calculation based on the volume of the autoclave contrary to the Examiner's suggestion, does represent the real density of the monomers at their supercritical conditions.

For the above reasons, it is respectfully submitted that the amended claims are neither anticipated nor obvious over any of Saito et al. and DeSimone et al., and withdrawal of the foregoing rejections is respectfully requested.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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